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Fuzzy identification of systems and its applications to modeling and control. (English)

Zbl 0576.93021

IEEE Trans. Syst. Man Cybern. 15, No. 1, 116-132 (1985).

The paper presents a mathematical tool to build a fuzzy model of a system. Using multidimensional fuzzy reasoning suggested by the same authors [Fuzzy Sets Syst. 9, 313–325 (1983; Zbl 0513.94035)], they surprisingly reduce the number of implications, so that fuzzy implication is improved and reasoning is simplified. The presented fuzzy implication is quite simple. It is based on a fuzzy partition of the input space. In each fuzzy subspace a linear input-output relation is formed. The output is given by the aggregation of the values inferred by some implications that were applied to an input. The method of identification of a system using its input-output data is also shown. Practical applications of the proposed method to real industrial processes are presented. The results are fair and suggest applicability of the proposed method.

Reviewer: R.Vachnadze

MSC:

93B30 System identification

93B15 Realizations from input-output data

94D05 Fuzzy sets and logic (in connection with information, communication, or circuits theory)

68U20 Simulation (MSC2010)

Cited in **9** Reviews

Cited in **1337** Documents

Keywords:

fuzzy model; multidimensional fuzzy reasoning; input-output relation; identification

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